

Valvular Heart Disease in Pregnancy : Review and a Case Report

Khadijeh Rezaie Keikhaie ¹, Zohreh Mahmoodi *²

¹Department Obstetrics and Gynecology, Maternal and Fetal Health Research Center,
Zabol University of Medical Sciences, Zabol, Iran

²Department of Cardiology, Faculty of Medicine, Zabol University of Medical Sciences, Zabol, Iran

Abstract

Introduction:

Cardio circulatory changes associated with pregnancy may result in a significant hemodynamic burden and can lead to morbidity and even mortality in women with cardiac disease(3). Women with congenital heart disease now comprise the majority of pregnant women with heart disease seen at referral centres(4). in the presence of maternal heart disease, the circulatory changes of pregnancy may result in decompensation or death of the mother or fetus(3).therefore extra attention is needed to be payed in these cases.

Case report:

A 19-year-old woman with twin pregnancy gravida II para I was complaining at 21 weeks gestation of shortness of breath and dyspnea on exertion. The echocardiogram revealed severe dilatation of right ventricle, mild to moderate TR , mild MR.the patient was taken to CCU for better cardiac monitoring.

Discussion:

The higher maternal mortality rates may be due to instability of the cardiac status due to advanced cardiac involvement in the disease process. However, good patients' compliance and the high quality antenatal care provided may have contributed to the lack of maternal mortality in some studies. Mitral valve disease was seen more commonly compared to aortic valve disease in pregnant women in the most studies.Regurgitant valve disease is well tolerated during pregnancy due to the systemic vasodilatation favors forward flow and the left ventricular filling is rapid and unimpeded. The regurgitant flow tends to decrease with the increased cardiac output and fall in the systemic vascular resistance.

Keywords : valvular heart disease, pregnancy, cardiac disease

INTRODUCTION

Normal pregnancy is associated with an increase of 30 to 50 percent in blood volume and a corresponding increase in cardiac output. Concurrently, the heart rate increases by 10 to 20 beats per minute, the stroke volume increases, and there is a substantial reduction in systemic vascular resistance, with decreases in blood pressure(1). The poor tolerance during pregnancy seems to result from a low, pregnancy-independent exercise capacity superimposed on the gestational cardiovascular demands, insufficient adaptation of the right heart and poorly compliant pulmonary vasculature (2). Cardio circulatory changes associated with pregnancy may result in a significant hemodynamic burden and can lead to morbidity and even mortality in women with cardiac disease(3). Women with congenital heart disease now comprise the majority of pregnant women with heart disease seen at referral centres(4). in the presence of maternal heart disease, the circulatory changes of pregnancy may result in decompensation or death of the mother or fetus(3).presence of valvular heart disease in pregnant women is a risk to the fetal well-being. Pregnant women with valvular heart disease and good cardiac status during pregnancy have been shown to develop less intrauterine growth retardation, less premature births and less maternal mortality and morbidity(6). In the presence of valvular heart disease, careful cardiac and obstetric management in a tertiary referral center is recommended for optimal maternal and fetal outcome(7). During pregnancy, valvular heart disease is commonly complicated by congestive cardiac failure. Hemodynamic changes during pregnancy are stressful to

the cardiovascular system. A woman with previously asymptomatic cardiovascular disease may develop life-threatening cardiac failure due to the increase in blood volume during pregnancy(8) .

CASE PRESENTATION:

A 19-year-old woman with twin pregnancy gravida II para I was complaining at 21 weeks gestation of shortness of breath and dyspnea on exertion.the ultrasound diagnosis of age of pregnancy,placenta, embryo and heart rate showed the heart rate of both embryos,the embryos were both in transverse position.AFI was 30cm in bigger twin and 1cm in the other twin. These evidences can be suggestive of twin to twin transfusion syndrom . The patient has undergone a valvuloplasty surgery for congenital pulmonary stenosis at age 3. She was referred to a cardiologist and underwent transthoracic echocardiography. The echocardiogram revealed severe dilatation of right ventricle, mild to moderate TR , mild MR.the patient was taken to CCU for better cardiac monitoring and received TNG serum and tablet carvedilol QID .she had a normal vaginal delivery with no complication. and she leaved hospital with good general status..

DISCUSSION:

Although the prevalence of clinically significant maternal heart disease during pregnancy is low (prob- ably less than 1 percent, its presence increases the risk of adverse maternal, fetal, and neonatal out- comes (9). The American Heart Association and the American College of Cardiology

have classified maternal and fetal risk during pregnancy on the basis of the type of valvular abnormality and the New York Heart Association (NYHA) functional class. The absolute risk conferred on a given woman by pregnancy also depends on additional clinical factors. Recent analyses of the outcomes of pregnancy in Canada identified predictors of adverse maternal and fetal outcomes in a heterogeneous group of women with congenital or acquired heart disease (546 women and 599 pregnancies). Approximately 40 percent of the women had a primary valve disorder. Adverse maternal cardiac events (pulmonary edema, sustained brady arrhythmias or tachy arrhythmias requiring therapy, stroke, cardiac arrest, or death) occurred in 13 percent of completed pregnancies and were significantly more likely among women with reduced left ventricular systolic function (an ejection fraction below 40 percent), left heart obstruction (aortic stenosis with a valve area of less than 1.5 cm^2 or mitral stenosis with a valve area of less than 2.0 cm^2), previous cardiovascular events (heart failure, transient ischemic attack, or stroke), or disease of NYHA class II or higher. These outcomes occurred in 4 percent of the women with none of these risk factors, 27 percent of those with one risk factor, and 62 percent of those with two or more risk factors(10). The higher maternal mortality rates may be due to instability of the cardiac status due to advanced cardiac involvement in the disease process. However, good patients' compliance and the high quality antenatal care provided may have contributed to the lack of maternal mortality in some studies. Mitral valve disease was seen more commonly compared to aortic valve disease in pregnant women in the most studies. Mitral valve prolapse was the most common condition seen in studies. This cardiac condition is known to cause sudden death in pregnant women, mainly attributed to electrical instability leading to cardiac arrhythmias(11). Regurgitant valve disease is well tolerated during pregnancy due to the systemic vasodilatation favors forward flow and the left ventricular filling is rapid and unimpeded. The regurgitant flow tends to decrease with the increased cardiac output and fall in the systemic vascular resistance. Should symptoms develop, such as a patient with mitral valve disease developing atrial fibrillation and rapid ventricular rate, aggressive medical therapy is indicated. Direct current cardioversion can be carried out following transesophageal electrocardiography, to exclude any thrombus in the left atrium. Mitral valve prolapse causing mitral regurgitation tends to diminish during pregnancy due to the increased left ventricular volume and most patients do well(12). In severe mitral stenosis the physiological rise in cardiac output and a rise in pulse rate, in combination with increased blood volume, leads to further increments in an already raised left atrial pressure. The diastolic filling time is decreased, leading to an increase in pulmonary venous pressures and pulmonary congestion. Further increases in cardiac output during labor will add to the patients risk of pulmonary edema. The increased left atrial pressure and volume predisposes the patient to atrial arrhythmias and thrombus formation in the

atrial appendages(13). In patients with significant mitral stenosis (mitral valve area $<1.0 \text{ cm}^2$) and more than New York Heart Association (NYHA) functional class II, despite aggressive medical therapy, consideration should be given to urgent surgical intervention. Percutaneous balloon mitral valvoplasty and closed valvotomy has also been successfully and safely performed in pregnancy. Although surgery can be performed safely in pregnancy, most authors would generally recommend early intervention before pregnancy(14). Aortic stenosis is uncommon in pregnancy and complications arise mainly in women with severe stenosis, as a result of a restricted capacity to raise cardiac output. It is associated with a maternal mortality of 17%. All patients with multiple valve involvement delivered at or near term with no serious complications. It is however, recommended to delivery patients with multiple valve involvement much earlier than the expected time of delivery to avoid complications(15).

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